

Whale

DEPARTMENT OF COMMERCE  
OCEANIC AND ATMOSPHERIC ADMINISTRATION  
FISHERIES SERVICE  
HONOLULU LABORATORY

BOX 3830

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COM-210



Turtle Hatchlings

FFS 1984

East Island  
Whale skate

*Handwritten notes:*  
do in lab of July  
small's study table  
Diet table  
see the  
Babine  
is a  
had  
Hawaii  
Hatchlings  
as per  
12/22/95



# LEVEL

NOTEBOOK NO. 311

Turtle Hatchlings FFS  
East Island 1984  
Whaleskote

7/27 Friday East Turtles

Eruption sites

- 1 - 2 heads surfaced at 9:14 + 11:22<sup>pm</sup>  
gone Sat. by 9am
- 2 - 1 head at 9:14
- 3 - 6 in depression at 8:57  
1 more at 9:07
- 4 - 1 head surfaced  
16 out at 9:11
- 5 - 4 heads surfaced -  
15 min. later 4 in depression  
1 more at 9pm
- 6 - not to be included

\* "Habitat Enhancement" money available

7/28

1 - II

2 -

3 -

4 - III

5 -

6 - 53 turtles from new site  
large coral debris w/  
sticks on top of nest  
7/28 uncovered

1  
1  
1  
1  
16  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40

1. Measure depth of 1st turtle or egg sighted from surface
2. - count how many live turtles still in rubble -  
- count eggs still remaining
3. estimate how many total eggs in nest
4. calculate % coral rubble in relation to size in sand - try to get different sizes from at least 3 sites (grades of soil) sand
5. any correlation between coral rubble size and # of live turtles?
6. measure depth of nest to bottom of eggs
7. estimate length + width of nest (egg chamber) itself

7/29

sites

①

②

3-

4-

⑤

6-

Soil types-

- 1- beach-type sand and small coral not exceeding 2 cm
- 2- intermediate particles w/ debris scattered throughout nest, not exceeding 5-7 cm
- 3- heavy pieces of debris larger than 7 cm found on top and in the nest chamber (noticeable)

### Dug 8" ### ### ### 11

### Dug 6" ###

### ### ###

8/1' new sites

7- nothing - disregard - disregard

8- 4 dead; 2 great crabs eating

9- ~~nothing 11 pm~~ Same as 5

10- 1st turtle out @ 10:49 pm

11- dug up @ 11:30 pm - disturbed

12- heavy large debris - a few dead on top; w/ weak, depressed-dented living ones on top.

to be dug up 8/2 by Susy

13- undisturbed; heavy coral rubble

site #	date of marking dig	general soil type	depth to 1st egg or hole	# of live turtles	# of dead turtles out / on shell	# eggs unatched	# of eggshells	estimated total eggs	depth to bottom of nest	dimensions of egg chamber
1	7/27 8/3	2	12cm	27	1/0	0	82	82+2	65cm	50 x 35cm
4	7/27 8/3	2	20cm	2	0/2	2	88	92+30	65cm	50 x 45cm
5	7/27 8/2	2	24cm	57	10/47	4	62	113+9	78cm	50 x 45cm
7	8/6 8/9	3	4cm	40	2/5	7	95	107	46cm	40 x 32cm
8	8/7 8/9	1	11cm	96	0/1	7	87	95	66cm	50 x 40cm
10										
13	8/1 8/4	3	5cm	80	3/18	0	69	87	68cm	50 x 40cm
14	8/1 8/4	3	6cm	24	2/26	59	35	120	47cm	40 x 30cm

Coral site #	% coral debris particles in relation to sand	NOTES
1	20% nest w/ particles > 3 cm; a few large rocks & 7-8 cm.	A few pieces of debris (rock coral, shells) > 5 cm; most > 1 cm; 1st turtle dead w/ head eaten partly & debris; pieces of scrap iron in nest between 5-7 cm
4	15% nest w/ debris > 3 cm; not include lot of large chunks in nest	Small coral in hole on top w/ long pieces 10 x 3 cm; soil fairly sandy but not that of debris 3-4 cm; many eggs & soil brown yellow; a few lg. coral around nest (= 15 ch)
5	15-20% nest w/ debris > 3 cm; some large coral + shells = 7-8 cm	Top of nest = 10 x 7 cm coral; a few lower than 5 cm; nest piece not exceeding 4 cm; turtles small & weak; man-made rubble cap 4 cm
7	A lot of soil filled w/ 2-3 cm debris + pieces; 25% of nest; soil type became b. d. below surface but many more particles > 3 cm; turtles scrawny - yolk sac	Top of nest completely covered w/ large chunk of coral (10 x 3 + 12 x 10 cm); coral pieces of coral = 14 cm; 1 dead & 5 alive up to 8 x 7 shells; soil packed turtles lodged next to debris;
8	5% soil filled w/ 2-3 cm; some large debris but loose; a few (1-2) pieces 3 x 8 cm in soil;	Top of nest quite sandy w/ 1 cm particles in depressions; a few large particles in nest - one turtle's head stuck in hole; coral just less than 1 cm; debris were found dead out of hole
13	soil packed a bit harder; 25-30% debris > 3 cm and about 10% > 8 cm	Nest of large debris on top + surrounding nest - one coral chunk 13 x 8 cm imbedded just below surface; some ghost crab holes also; 1st turtle dead
14	25-30% debris > 3 cm; many large pieces 8-10 cm through nest - a lot of unattached eggs; 6 dead turtles found beneath a 6 x 10 cm coral	Many particles 3-5 cm on top and compl. surrounding nest; 12 x 5 cm & 10 x 8 cm coral just below surface; dead turtle beneath it, 15 x 10 cm chunk about 20 cm down;



8/9 Round 13:05  
end 13:20

3 W

W ♂  
W

A ♀ w/P<sub>1</sub>

4 W

Total 9 W  
A ♀ and Pup N  
Net Gone

Nights spent on:

Tern 7/24 - 7/25

East 7/26 - 7/29

Tern 7/30 - 7/31

East 8/1 - 8/3

Tern 8/4 - 8/5

East 8/6 - 8/8

Tern 8/9 - 8/11

Honolulu 8/12

4 nights

3 nights

3 nights

10 nights spent  
in East Island

include:

- ① how # of eggshells was determined
- ② dead turtles in/out of shell
- ③ why waited 72 hrs. to dig after eruptions
- ④ how nests were "dug" up
- ⑤ size of hatchlings compared to some of the debris

SITE #	DATE of marking	DATE of dig	general SOIL TYPE 1, 2, 3	DEPTH to 1st EGG/TURTLE	# of live turtles	# of DEAD turtles out/in shell	# of EGGS UNHATCHED (turtles)	# of EGGS SHELLS	Estimated TOTAL EGGS	DEPTH to bottom of NEST	DIMENSIONS of EGG CHAMBER
① 1	7/27	8/3	2	12cm <sup>T</sup>	27	1/0	0	82	82+2 84	65cm	50x35cm
② 4	7/27	8/3	2	20cm <sup>T</sup>	2	0/2	2	88	92+30 122	65cm	50x45cm
③ 5	7/27	8/2	2	24cm <sup>T</sup>	57	10/47	4	62	113+9 122	78cm	50x45cm
④ 7	8/6	8/9	3	4cm <sup>T</sup>	40	2/5	7	95	107	46cm	40x32cm
⑤ 8	8/7 <sup>am</sup>	8/9	1	11cm <sup>T</sup>	96	0/1	7	87	95	66cm	50x40cm
⑥ 13	8/1	8/4	3	5cm <sup>T</sup>	80	3/18	0	69	87	68cm	50x40cm
⑦ 14 Whaleskate	8/1	8/4	3	6cm <sup>T</sup>	24	2/26	59	35	120	47cm	40x30cm

% CORAL/DEBRIS  
PARTICLES IN RELATION TO SAND

NOTES

20% nest w/ particles > 3cm; a few large rocks ≈ 7-8cm

A few pieces of debris (rocks, coral, shells) > 5cm; most not > 10cm; 1<sup>st</sup> turtle dead w/ head eaten partly away; pieces of scrap iron in nest between 5-7cm

15% nest w/ debris > 3cm; not a whole lot of large "chunks" in nest

Small coral rubble on top w/ long pieces 10x3cm; soil fairly sandy but has alot of debris 3-4cm; many eggshells + soil stained yellow? A few very lg. coral around nest. (≈ 15cm)

15-20% of nest w/ debris > 3cm; some large coral + shells ≈ 7-8cm

Top of nest - 10x7cm coral; a few larger than 5cm; most pieces not exceeding 1x2cm; turtles small + weak; man-made rubber cap - 4cm long

Alot of soil filled w/ 2-3cm debris + packed ≈ 25% of nest; soil type became a "2" below surface - but many particles > 3cm; turtles screaming - yolk sacs gone + dehydrated

Top of nest completely covered w/ lg. chunks of coral (9x8 + 12x10cm); long pieces of coral 14cm; 1 dead + 5 alive under 8x7cm shell - soil packed, turtles lodged next to debris

5% of soil filled w/ 2-3cm - sandy + damp, but loose; a few (3) pieces 3x8cm in soil

Top of nest quite sandy w/ 1cm particles in depression; A few lg. part. in nest - one turtle head caught in long coral; turtles very healthy looking - none were found dead out of shell (Gail-photo)

Soil packed a bit harder; 25-30% debris > 3cm and about 10% > 8cm

Alot of large debris on top and surrounding nest - one coral chunk 13x8cm imbedded just below surface; some ghost crab holes; 1<sup>st</sup> turtle was dead

25-30% debris > 3cm; many lg pieces 8-10cm throughout nest - alot of unhatched eggs; 6 turtles found dead beneath a 6x10cm coral piece

Many particles 3-5cm on top + completely surrounding nest; 12x5 + 10x8cm coral just below surface - dead turtle beneath; 15x10cm chunk about 20cm down

## Soil types

- ① beach-type sand (more refined) and, <sup>most</sup> small coral not exceeding 2 cm (5-10% of nest) <sup>3-5 cm</sup> throughout nest
- ② intermediate particles w/ debris scattered throughout nest, not exceeding 5-7 cm (15-20% of nest) <sup>3-5 cm</sup>
- ③ heavy pieces of debris larger than 7 cm found on top and in the nest chamber - noticeable! (>20% of nest 3-5 cm)

unfinished ...

A total of seven green sea turtle nests were dug up on East and Whale-Skate Islands, French Frigate Shoals, Northwestern Hawaiian Islands during the period 2 August to 8 August, 1984. After spotting an eruption site from the previous night, nests were marked and left untouched for at least 72 hours, with exception to one nest (Site #8) which was dug up after 48 hours.

The nests were assigned a soil type according to the percentage of particle debris each one contained. These were made on a purely observational basis by the observer as she dug up each nest. Three soil types were defined as follows:

- 1--Beach-type sand (more refined) and most of small coral not exceeding 2 cm<sup>2</sup>. 5-10% of nest contained 3-5 cm<sup>2</sup> particles throughout.
- 2--Intermediate particles with debris scattered throughout nest, mostly not exceeding 5-7 cm<sup>2</sup>. 15-20% of nest contained 3-5 cm<sup>2</sup> debris.
- 3--Heavy pieces of debris larger than 7 cm<sup>2</sup> found on top and in the nest chamber-- very noticeable. Particles 3-5 cm<sup>2</sup> composed more than 20% of nest.

There was only one nest dug up with a soil Type 1 because of limited nests in that particular medium. Eruption sites were hard to find in the sandy beach areas and those nests were few because they were mainly located on the periphery of East Island. Some nests may have also been "washed away" in these areas during high tides.

Soil Type 2 nests were most abundant and three were dug up on East Island. Most of the debris gathered on the nest's surface depression and thus were easily sighted.

Three nests being of soil Type 3 were a bit harder to locate since the debris was distributed over and around the nest more uniformly. One of the nests was dug up on Whale-Skate Island in a heavily cluttered debris area of coral and rock. The two nests on East Island were packed harder with soil than the other nests.

Measurements of each nest were recorded including depth, length and width of egg chamber. The depth to the first turtle under the surface was also recorded.

The debris on East Island is scattered pretty evenly over the 12-acre sand spit with exception to the peripheral edge. Large chunks of cement, wire, scrap iron and various material were left behind when a Coast Guard station was disassembled years ago. There are tremendous amounts of coral and also debris from boats at sea (bottles, floats, shoes, etc.) that are washed onto the shoreline of East Island and somehow get moved more toward the center of the island *during winter storms*

# 1984 PFS Hatchling Study

Site #	SOIL TYPE	# of live turtles	# of DEAD turtles out/in shell	# of eggs unhatched	% # of egg shells	Estimated Total Eggs		% Live turtles est. total turtles
						Total Eggs	Corrected	
8	1	96	0 / 1 = 1	7	87	95	104	92%
1	2	27	1 / 0 = 1	0	82	84		32%
4	2	2	0 / 2 = 2	2	88	122		1.6%
5	2	57	10 / 47 = 57	4	62	122		47%
7	3	40	2 / 5 = 7	7	95	107		37%
13	3	80	3 / 18 = 21	0	69	87		92%
14	3	24	2 / 26 = 28	59	35	120		20%

.27

.50

12  
8  
16

NOTES -

- 7 nests were dug up during the period: 2 August - 8 Aug. with various soil types.
- Define soil types 1, 2, 3
- All but one nest was unburied at least 72 hours after initial eruption sighting - #8 dug up after 48 hours
- Number of live turtles ranged from 2 (type 2) to 96 (type 1) that were "resting" in nest
- Number of dead turtles out of their shell ranged from 0 (type 1+2) to 10 (type 2)
- Number of dead turtles in shell ranged from 0 (type 2) to 47 (type 2)
- Number of eggs unhatched ranged from 0 (type 2+3) to 59 (type 3)
- Estimated total eggs ranged from 84 (type 2) to 122 (type 2+2)
- All nests but one were dug up on East Island - #14 was dug up on Whaleskate



unfished...

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